119

I

Total No. of Questions—21

Total No. of Printed Pages—2 **Regd. No.** ☐☐☐☐☐☐☐☐☐☐

Part III
PHYSICS
Paper I
(English Version)

Time : 3 Hours ***Max. Marks : 60***

SECTION A

10×2=20

***Note* :—** (*i*) Answer ALL questions.

(*ii*) Each question carries TWO marks.

(*iii*) ALL are very short answer type questions.

1. What is the contribution of S. Chandrasekhar to Physics ?
2. Express unified atomic mass unit in kg.
3. Two forces of magnitudes 3 units and 5 units act at 60° with each other. What is the magnitude of their resultant ?
4. If a bomb at rest explodes into two pieces, the pieces must travel in opposite directions. Explain.
5. Why are drops and bubbles spherical ?
6. What is angle of contact ?
7. Can a substance contract on heating ? Give an example.
8. What is greenhouse effect ? Explain global warming.
9. State Boyle's Law and Charles' Law.
10. What is the expression between pressure and kinetic energy of a gas molecule ?

SECTION B

6×4=24

***Note* :—** (*i*) Answer any SIX questions.

(*ii*) Each question carries FOUR marks.

(*iii*) ALL are short answer type questions.

11. Can the velocity of an object be in a direction other than the direction of acceleration of the object ? If so, give an example.

12. Show that the trajectory of an object thrown at certain angle with the horizontal is a parabola.

13. Mention the methods used to decrease friction.

14. Distinguish between centre of mass and centre of gravity.

15. Explain about the centre of mass of earth-moon system and its rotation around the sun.

16. What is escape velocity ? Obtain an expression for it.

17. Describe the behaviour of a wire under gradually increasing load.

18. Explain Celsius and Fahrenheit scales of temperature. Obtain the relation between Celsius and Fahrenheit scales of temperature.

SECTION C

2×8=16

***Note* :—** *(i)* Answer any TWO questions.

(ii) Each question carries EIGHT marks.

(iii) ALL are long answer type questions.

19. Develop the notions of work and kinetic energy and show that it leads to work-energy theorem.

20. Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is the length of a simple pendulum which ticks seconds ?

21. State second law of thermodynamics. How is heat engine different from a refrigerator ?